THE

Malayan Agricultural Journal.

OCTOBER, 1939

EDITORIAL.

The School of Agriculture, Malaya.

It is not often realized that the School of Agriculture, Malaya, is the culmination of a proposal originally put forward as far back as 1912. An article in this number traces developments from that time up to 1931, when the School opened its doors for the first time, and proceeds to explain the considerations which led to the adoption of the policy now governing its operation.

Malaya is primarily an agricultural country and the probability is that it will always remain so. Here as elsewhere, the application of science to agriculture is requiring an increasing standard of technical knowledge on the part of those who practise this mode of life. As a result, it is obvious that local agricultural education is a matter of fundamental importance to the successful development of this country.

The article shows that there are in the main three forms of occupation open to students who have successfully completed one or other of the two courses at the School. Government service and semi-official employment such as is provided by the Rubber Research Institute of Malaya have up to the present absorbed the greatest proportion of those students whose histories since leaving the School are known. The next largest group consists of those students who have failed to keep in touch with the School and who presumably have in the majority of cases returned to the *kampong* or other family property to become small-holders or managers, while the smallest group consists of those students who are known to have found salaried employment in commercial enterprises, such as estates. It is pointed out that the major difficulty in increasing the proportion of this last group lies in the fact that, while the majority of estates in this country are operated by South Indian or Chinese labour forces and the normal estate preference is for conductors to be of the same race as the labourers in their charge, students of these nationalities who ultimately have in view estate employment have not up to the present been forthcoming in adequate numbers to satisfy the known demand.

The article also refers to an interesting attempt that is being made to determine if it is possible to encourage and fit selected Malay students for estate employment, and it concludes with a picture of student life at the School.

Rat Control. Rats are a menace in Malaya, as in most other countries, and although the economic losses they occasion here are not known with any degree of accuracy, they are undoubtedly very serious. These rodents attack growing crops and either consume or spoil stored agricultural products such as rice. In addition, they are the vehicles of several formidable diseases of humans, such as tropical typhus, leptospirosis, plague, melioidodis and rat-bite fever, and are also hostile to animals such as pigs and to poultry.

Local readers of this Journal will need no reminding of the very energetic measures that have been adopted in some districts to minimize rat damage in the case of the padi crop, and an article in this number describes the various rat-control measures practised by local oil palm estates. Rats frequently cause considerable damage on such estates, since they may attack the palm during all stages of its growth and may lead to serious diminution in production of oil and kernels, and they are best controlled by a combination of preventive and exterminative measures. The chief preventive measure consists of modifying or removing estate conditions which provide harbourage or protected breeding places. On some estates, for example, it has been found that the removal of jungle timber and of dense cover crops has contributed materially to a reduction of the rat population.

The exterminative measures practised at the present time on oil palm estates are: hunting with dogs, trapping, poisoning and the establishment of cat farms. Considered individually these measures are of varying applicability and utility. The rat is a cautious and intelligent animal and gradually becomes accustomed to certain control measures, hence the best results are normally secured by employing a variety of such measures, either concurrently or in rotation. It has been authoritatively stated, too, that under very favourable conditions the rate of multiplication of rats is such that a single pair may increase to almost nine hundred living descendents at the end of a year. The significance of this characteristic in control work, and of the potential migratory habit of rats, is that the measures adopted are found to be most effective when they are applied in a sustained and systematic manner over fairly wide areas. Spasmodic measures are usually a waste both of time and money.

Original Articles.

THE SCHOOL OF AGRICULTURE, MALAYA.

BY
G. E. MANN, M.C.
Principal, School of Agriculture, Malaya.

The School of Agriculture, Malaya, was opened in May, 1931. It is situated at Serdang, about 14 miles from Kuala Lumpur, and adjoins the Central Experiment Station of the Department of Agriculture, Straits Settlements and Federated Malay States. The main building includes four class rooms, two laboratories, library, museum, staff common room, offices and store-rooms. The hostel, in which all students are required to reside during term, comprises four dormitories with modern sanitation, dining hall and kitchens, and students' common room. The School can accommodate 80 students. Two courses of instruction are given. The major course, lasting two years, is conducted in English and provides a training in the theory and practice of tropical agriculture with special reference to Malayan conditions. Applicants are normally required to have passed at least the Cambridge Junior Local examination. The minor course, lasting one year, is conducted in Malay, and class work follows more elementary lines appropriate to the lower educational standard of students who have either not attended a secondary school at all or who have succeeded in reaching only Standard V therein.

The School is owned and maintained jointly by the Governments of the Federated Malay States and Straits Settlements, the latter contributing 22 per cent. of the cost—an arrangement based on the relative acreages alienated for agriculture up to 1930. The capital cost, including staff quarters and various outbuildings, was about $264,000; while maintenance, including staff salaries, is about $45,000 per annum.*

Before proceeding to a detailed description of the School, an account may be given of the events leading up to its inception. This ante-natal history is not only interesting but goes back considerably further than many residents in Malaya realize.

Early in 1912, the then Chief Secretary to Government, F.M.S., (Sir E. L. Brockman) put forward proposals regarding the training of agricultural students by the Department of Agriculture. These proposals were immediately overshadowed by others originating from almost the opposite side of the globe. In a memorandum dated 23rd May, 1912, Sir (then Dr.) Francis Watts, Commissioner of Agriculture, West Indies, submitted to the Colonial Office a proposal for the

* $1 (Straits) = 2s. 4d.

Note.—The above article was written primarily at the request of the Editor of *Oversea Education* for publication in that periodical (which is published at the Colonial Office for the Secretary of State for the Colonies) and he has approved publication also in the *Malayan Agricultural Journal.* A slightly abridged version of the article was published in *Oversea Education.*

creation, somewhere in the British tropics, of an Agricultural College and Institute of Tropical Agricultural Research, to be regarded as serving not merely the colony in which it was established but to have regard to wide tropical interests embracing, if necessary, the whole range of the world's tropical concerns. Such an institution, Sir Francis suggested, might serve to afford the education and training required by students who were to undertake the work of planters, thus training the men who would ultimately be in charge of tropical agricultural enterprises; to give training in the special problems presented by the tropics relating to agriculture and allied subjects in connexion with such special studies as entomology, mycology, agricultural chemistry and soil problems, the object being to complete the training, so far as tropical considerations were concerned, of the specialists required in these branches of work throughout the tropics; and finally to afford facilities for advanced study, research and experiment in connexion with agriculture and plant problems, in the wide ranges including plant physiology and plant breeding and the problems underlying the production of crops. In this direction, the proposed institution was to form a corollary to schools of agricultural research in Great Britain and would usefully enlarge their outlook.

Sir Francis suggested Trinidad as the most suitable home for the College. The Secretary of State for the Colonies, however, was evidently not prepared to accept Trinidad off-hand. He submitted the memorandum to the High Commissioner, Malay States, who consulted the Rulers and Members of Council as to the possibility of locating the College in the Federated Malay States. On the whole, the suggestion met with a favourable reception; one or two people thought that Ceylon would be a better choice but only one Member of Council voiced any decided opposition. He considered that, if a College of Agriculture were established in the F.M.S., the greatest demand for places would come from local Asiatics but that posts carrying salaries commensurate with the qualifications of graduates would not be forthcoming for them.

In reporting to the Secretary of State, the High Commissioner (Sir Arthur Young) welcomed the scheme but asked for estimates as to its cost. Meanwhile, early in 1914, a local committee was appointed to consider the proposals in detail. The then Director of Agriculture (Mr. Lewton Brain) expressed his opinion that, if the College were eventually to train both Europeans and Asiatics, it would be easier to add Asiatics on to Europeans than *vice-versa;* and that, for native education, it would be preferable to start from the bottom, teaching small-holders by demonstrations and visits to their holdings, by starting school gardens and perhaps later on by opening one or two agricultural schools. He believed that existing colleges in England could already turn out as good, or nearly as good, estate managers as could a college in Malaya and he therefore doubted whether the extra expense involved by a preliminary training in this country would be justifiable. If a College were to be established in Malaya, it should be primarily a research institution, supplementing the work of the Department of Agriculture.

In June, 1914, the committee reported unanimously that, in the first instance, a local School of Agriculture was desirable but that it should aim at training natives and other inhabitants of the country, Asiatic landed proprietors, village headmen, native subordinates of the Agricultural and kindred Departments, and conductors and native assistants on estates. In other words, the committee recommended the creation of a technical school the scope of which might be expanded later on by including a measure of research work.

Then came the European War with all its financial and other difficulties, and, so far as Malaya was concerned, the proposals for an Agricultural College had to be shelved. Trinidad thus came back into the picture; the West Indian Agricultural College was established there in 1921 and, in 1924, it became the Imperial College of Tropical Agriculture.

From 1914 to 1924 various attempts were made to revive interest in a Malayan School of Agriculture but no material progress was made, again owing to financial difficulties. Prior to 1924, junior Asiatic officers in the Department of Agriculture, S.S. & F.M.S., were attached individually, for purposes of training, to senior officers either at headquarters or in the field. The system had certain defects, one of which was that recruits (none of whom had any previous scientific education) tended to receive a somewhat unbalanced training. In 1924, therefore, a small departmental school was opened in a semi-permanent building at headquarters with accommodation for two classes of 10 students each. One European and one senior Malay Officer were detailed as instructors, and a modest but definite syllabus was introduced, covering a period of two years. Little practical field work was possible and the School made a rather shaky start in some ways, but it eventually settled down and, in fact, proved quite a success in a limited way.

Public opinion became more insistent about this time and, in 1927, an advisory committee was appointed by Government to draw up a scheme for a School of Agriculture as a joint institution for the Federated Malay States and Straits Settlements. This committee recommended that the purpose of the School should be to provide adequate agricultural training for apprentices in the Department of Agriculture and possibly other Departments and for such private students as might be forthcoming. Two courses of training were envisaged—a three year course in the principles and practice of scientific agriculture and a two year practical course with special reference to the major crops of the Peninsula. Proposals relating to staff and buildings were drawn up and work was begun on the preparation of a 22 acre site at the Government Experimental Plantation (now known as the Central Experiment Station) at Serdang. Special expenditure was voted by the F.M.S. & S.S. Governments in the 1929 to 1931 estimates and the construction of buildings was begun in 1930. Meanwhile, with the advent of Dr. H. A. Tempany as Director of Agriculture, the advisory committee changed the proposed minor course to a one year course in the vernacular, designed partly to provide training for departmental subordinates and partly as a possible forerunner of a chain of farm schools throughout the Peninsula. Rapid progress was made in every respect about this time and the School was formally opened in May 1931, just before another serious financial depression set in.

So much for the ante-natal history of the School of Agriculture, Malaya, which thus extends over a period of some nineteen years. This long time, however, can in no way be attributed to apathy; nor did it fail to have its compensations in certain directions. For example, when the School did eventually open its doors, its objects had been crystallized and the staff was able to concentrate on a more definite programme than might otherwise have been possible. These objects were, in fact, threefold: (a) the training of Asiatic recruits for junior and subordinate appointments in the Department of Agriculture; (b) the training of Asiatics for salaried employment on estates, in private companies dealing with agricultural requirements such as fertilizers, and in the comparatively new Rubber Research Institute of Malaya, the extension work of which was soon to be expanded considerably in order to reach all rubber planters and not merely the larger estates, through a staff of Asiatic Rubber Instructors; and (c) the encouragement of new crops and particularly improved methods of cultivation on small holdings, through students who returned to their homes on leaving the School.

Clear-cut as these objectives are, they involve one difficulty in that the large majority of students at the School—at any rate since its first year or so of operation—have no precise idea as to where they will find employment until they have completed their training at the School. They have made up their minds to adopt agriculture as a career but, with few exceptions, they cannot be directed from the beginning to any particular outlet because vacancies may not exist at the time and, when they do occur, they need to be filled by selection based on the merits as well as the personal outlook of the various candidates. For this reason, and for reasons of economy as well, general rather than specialized courses of training are inevitable. With this qualification the major course is suitable for English-speaking students who hope to enter the Department of Agriculture or the Rubber Research Institute or who contemplate managing small estates or working as conductors on large estates, while the minor course is designed for non-English-speaking students who hope to gain subordinate appointments in Government service or who propose to return to small holdings owned by relatives or friends who are progressive enough to see possibilities in new crops or improved standards of husbandry. Students are therefore advised not to consider themselves as finished products when they leave the School but to regard themselves with a certain degree of humility as being, for a time, mere apprentices. In Government service and the Rubber Research Institute, junior officers recruited straight from the School are normally given a few months' *ad hoc* training by specialists to fit them for their particular duties. Estate managers in general also appreciate the circumstances and they usually arrange that any student who comes straight from the School is engaged on a short period of probation during which the employee has a fair opportunity of learning to handle labour and of adapting himself generally to estate conditions. If the young man shews promise, he is then offered a definite agreement with provision for annual increments of salary for some few years, after which the employee can be expected to bargain for himself and seek more lucrative and congenial employment elsewhere if he so wishes.

The acid test as to whether this policy is sound is to be found in the number of students (particularly private students) admitted each year and the number of salaried posts which they have secured. The School opened with 37 boys of whom only three taking the major course were private students. Numbers fell to 30 in 1932 owing to the widespread financial depression, and two important changes were therefore introduced. The first of these consisted in shortening the major course from three to two years, thus reducing the cost both to Government and to private students. The second involved the suspension (so far as the Colony and the F.M.S. were concerned) of the system of recruiting departmental apprentices as such and the substitution of a Government scholarship scheme involving no guarantee of subsequent employment. The number of students rose to 53 in 1933, 69 in 1934, 76 in 1935 and 80 in 1936. The latter two years were exceptional in that the Unfederated Malay States were making considerable use of the School in building up a larger staff of junior and subordinate officers. The change from a three year to a two year course had the opposite effect in that it naturally tended to a falling off in the number of students at the School, for one complete class had been lost. Numbers consequently declined to 68 in 1937 and 59 in 1938, but have risen in 1939 to 66. The corresponding numbers of private students admitted to the major course are 3, 3, 6, 9, 11, 12, 9, 11 and 8.

These last figures include only those boys who have completed or are now taking the major course; they do not include those who—for one reason or another—have left the School before completing the course, and they do not indicate the fact that—for the past few years—the number of applications for admission have been considerably in excess of the number of vacancies. Classes originally designed for 20 students are now required to accommodate 25 and, allowing for two major classes of 25 and one minor class of 15, the normal strength of the School may now be expected to be from 60 to 65 students, depending on wastage.

Turning now to the subject of employment, we find that of 256 students who have completed a course of training at the School, 189 are known to have found salaried employment. The true figure is almost certainly higher as some students have failed to keep in touch with the School, and their present occupations, if any, are unknown. Details of these 189 employees are as follows—

	Major Course	Minor Course
Dept. of Agriculture, S.S. & F.M.S. ...	22	39
-do- U.M.S.	8	48
Other Departments of Agriculture ...	2	1
Other Government Departments ...	5	5
Rubber Research Institute ...	39	0
Commercial enterprises ...	18	2
Total ...	94	95

It will be observed that only 20 boys have so far been absorbed into commercial enterprises such as estates. The reason for this lies not so much in a lack of demand on the part of estate managers as in the fact that many students have so far been able to secure more attractive appointments in Government service and the Rubber Research Institute, an advantage which will largely disappear as staffs become complete and new recruits are required only for replacing casualties.

While on the subject of estate employment, mention may be made of the rather peculiar position of Malay students. Practically all estates in Malaya are operated with either Chinese or South-Indian labour, supervised by conductors of the same race, and there exists a certain diffidence on the part of Malays to compete for such posts, while not a few experienced planters consider that Malays would be incapable of controlling a labour force of Indians or Chinese. One can understand these feelings up to a point. Any attempt to replace Chinese conductors by Malays would almost certainly be doomed to failure and any large-scale effort to replace Indian conductors would probably be equally futile and is in any case not contemplated. But one has yet to be convinced that Malays cannot be found who possess the necessary specialized characteristics and would settle down and make perfectly satisfactory estate conductors. They would naturally need more than a mere knowledge of the language; they would need to understand the life and customs of the labour force. But such knowledge can be acquired and there is at least a *prima facie* case for believing that Malays can be found who would rather work on an estate than remain idle. Provision has therefore been made recently by Government whereby selected Malay students at the School are taught colloquial Tamil and may, on completing the major course, be granted continuation scholarships and paid apprenticeships to enable them to acquire a sound knowledge not only of the language and customs of Tamil labourers but also of estate routine. The experiment has not been in operation long enough to indicate whether it will eventually succeed or fail, and it may take as much as ten years to decide one way or the other.

Something may now be said about the detailed working of the School. The present teaching staff consists of the Principal and Vice-Principal (both Europeans), an Assistant Lecturer (Chinese), a Junior Lecturer (Malay), and two Agricultural Assistants (both Malays). Class work ordinarily occupies 15½ hours and field work 18 hours a week. The usual day's programme consists of field work at the School from 6.30 to 8.30 a.m., lectures and laboratory work from 9.30 a.m. to 1.30 p.m. (12 noon on Fridays and Saturdays), and field work again from 4 to 4.30 p.m. For the first period students work communally, either on an area of about 14 acres of rubber (seedlings and budgrafted) or on other practical operations such as weeding, composting, nursery work, spraying and dusting with fungicides and insecticides, and so on. In the afternoon period, which lasts considerably longer, especially when crops are being newly planted, the students cultivate their individual plots—four beds per student, each about 27 feet long by 3½ feet wide and devoted to a rotation of short-maturation vegetable crops. In the course of a year, a student thus gains experience of some ten to twelve quick-growing crops suitable for sale

Erratum.

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page 395, 5 lines from the foot of the page, read:

"In the afternoon period, which lasts a minimum of only half an hour but may and usually does last considerably longer,"

or for home consumption, and this number can be doubled in the two year course. In all individual work, the necessary seed or other planting material is supplied by the School but students are encouraged to harvest their own produce and to take some of it home with them, the balance being consumed at the School. Senior students are also encouraged to test out their own ideas rather than follow any prescribed routine. In addition to such work, six students each week are detailed for practical instruction in the management of poultry, and a like number for the preparation of smoked rubber sheet from latex; while, towards the end of each calendar year, a whole month is given up exclusively to field work during which special intensive courses are arranged in connexion with such subjects as the bud-grafting of rubber, kiln-drying of copra, and the grafting of fruit trees. Every Tuesday, the whole morning from 6.30 a.m. to 12.30 p.m. is spent at the Central Experiment Station on practical work dealing with the cultivation and processing of the more important crops other than rubber, coconuts and rice; for example, oil palms, tea, coffee, fibre plants, spices, gambier and derris. The students thus cover a wide range of crops during their time at the School. It is to be admitted that practical work on rice cultivation is not possible at Serdang itself, but the large majority of the two year course students do not require this (for the crop is nowhere planted on an estate scale in Malaya) while arrangements can be made periodically for one year course students to spend a few days at a time in some convenient padi area. This is the main distinction drawn in field work between the two courses; the only other noteworthy distinction is that only major students receive training in factory procedure in relation to palm oil and tea manufacture.

In the major course, class work covers an extensive field, considering that it lasts only two years and that few students have had any scientific education before coming to the School. The syllabus comprises Chemistry and Physics, Botany and Mycology, Zoology, Principles of Agriculture, Field Crops, Agricultural Law, Horticultural Technique, Plant Pathology, Animal (including Poultry) Husbandry, Genetics, Estate Sanitation and Hygiene, Estate Records and Reports, Mathematics and Surveying. As far as possible, these subjects are developed in sequence—Science, Agricultural Science, Scientific Agriculture; but this ideal cannot be followed as closely as would be possible in a longer course. In the minor course, the lecture syllabus comprises Nature Study, Animal Study, Principles of Agriculture, Field Crops, Arithmetic, Agricultural Geography and Office Routine—all, of course, in a somewhat elementary way but not so elementary as would probably be found in a Farm School. The latter type of school is essentially a local institution, dealing mainly with the crops and requirements of the immediate surroundings. At Serdang, one year course students come from all parts of the Peninsula and a general rather than a localized training is required. Two Farm Schools have been opened in Malaya, one in Malacca and one in Penang, but they are conducted quite separately from the School at Serdang.

So much for the work of the School. It remains now to say something about more domestic arrangements. Of the four dormitories, two are occupied by Malays, the remainder by Chinese and others. Two menus, Malay and Chinese, are provided, each student getting five meals a day, three of which ("gun-fire," breakfast and tea) are quite light whereas lunch and dinner are comparative feasts. It should be remembered that young and growing lads doing a fair amount of field work have useful appetites. Catering is organized on somewhat complicated lines, not on a simple contract system, and the menus are capable of considerable variation without increasing the cost, which averages from 40 to 42 cents (say 11 pence) a head per diem.

In relation to games and recreations, the School is well equipped. In addition to association football, hockey and cricket, the boys can play tennis, badminton, volley ball and basket ball, while indoor games such as table-tennis, chess and draughts are available in the common room, where newspapers and suitable magazines and scientific periodicals are provided. All recreations are organized by the boys themselves through a Students Union under the control of the Principal assisted by a Games Master, and the four dormitories conveniently provide four houses for internal competitions. These houses are known as Watts, Hooker, Morris and Harrison, familiar names in the history of agricultural development in the British tropics. Games, however, are a somewhat expensive item, for there are comparatively few students. Government provides a sum of $225 (say £25) a year, but the students themselves have to contribute from $1.50 to $5 a year per head in order to keep everything going.

In relation to discipline, the regulations allow the students considerable freedom. Thus, the hostel is not locked at night; anyone may have leave till 11 p.m. but is required to report to a prefect when he returns. Week-end leave from mid-day Saturday until Sunday night is granted to anyone who wants it so long as his conduct and field work have been satisfactory. Serious breaches of discipline are very rare and punishments are seldom necessary. If a boy cannot respond to a few cautions, he is usually of the type that will not respond to anything; he makes poor progress and is sooner or later withdrawn from the School by his parents. In at least one respect, schoolboys in Malaya are no different from schoolboys elsewhere. They like their "bit of fun" and the majority do not work harder than is necessary. On the whole, students at Serdang give remarkably little trouble and it is seldom necessary to "lay down the law."

In conclusion, it may justly be claimed that the School is supplying what the country requires. It would probably be better balanced if more South-Indian students were forthcoming in order to supply the demand for conductors on estates, but neither Government nor the School itself is responsible for the present lack of support and the value of the School may be more appreciated by Indians as time passes. There would appear to be no need at present for any higher form of agricultural training in Malaya. It is true that, during the past few years, a new trend of organization has become evident whereby groups of estates are now employing

their own scientific officers for various lines of research; but enquiries made by the School from the larger estate agency houses indicate that, while there is likely to be a steadily increasing demand for students who have taken the two year course, the demand for more highly trained Asiatics would be too small to justify a policy of encouraging students to proceed to a University or similar institution on leaving the School. So far as the present and immediate future are concerned, the principal need is that students taking the major course should have had at least an elementary scientific education before entering the School. Indications are that conditions will improve in this respect in the near future and the staff will then be free to make even better use than now of the material at its disposal.

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THE RURAL LECTURE CARAVAN

BY

E. Ll. Jones,

Co-operative Marketing Officer, F.M.S. and S.S.

Two previous articles have been published* describing the construction and fittings of the Rural Lecture Caravan, which is run jointly by the Department of Agriculture, the Rubber Research Institute of Malaya, and the Co-operative Societies Department. These articles also contained accounts of the objects for which the Caravan is maintained and the methods of working used during the period 1930 to 1936.

The original caravan met with an untimely end, owing to an accident which occurred on January 3rd, 1938, on the Seremban-Tampin Road, when it skidded and hit the root of a rubber tree, afterwards overturning in the road. The body-work of the Caravan was smashed and the chassis badly damaged, though fortunately the driver and the cinema operator escaped serious injury.

The total mileage covered by the Caravan prior to the accident was approximately 42,000 miles.

Extensive repairs were necessary to the Kodascope film projector and to the amplifier equipment, and most of the lantern slides and agricultural exhibits were destroyed. A sum of $1,574 was received from the insurance company and the Government Factory took over the chassis of the dismantled wreck at a valuation of $150.

Construction of New Rural Lecture Caravan.

A sub-committee was formed consisting of members of the Department of Agriculture, Rubber Research Institute and Co-operative Societies Department, and this Committee was charged to make enquiries regarding the cost of a new Rural Lecture Caravan and to consider its design and equipment.

Pending the construction of a new Caravan, a covered van was lent by the Government Factory to carry on the normal instructional tours.

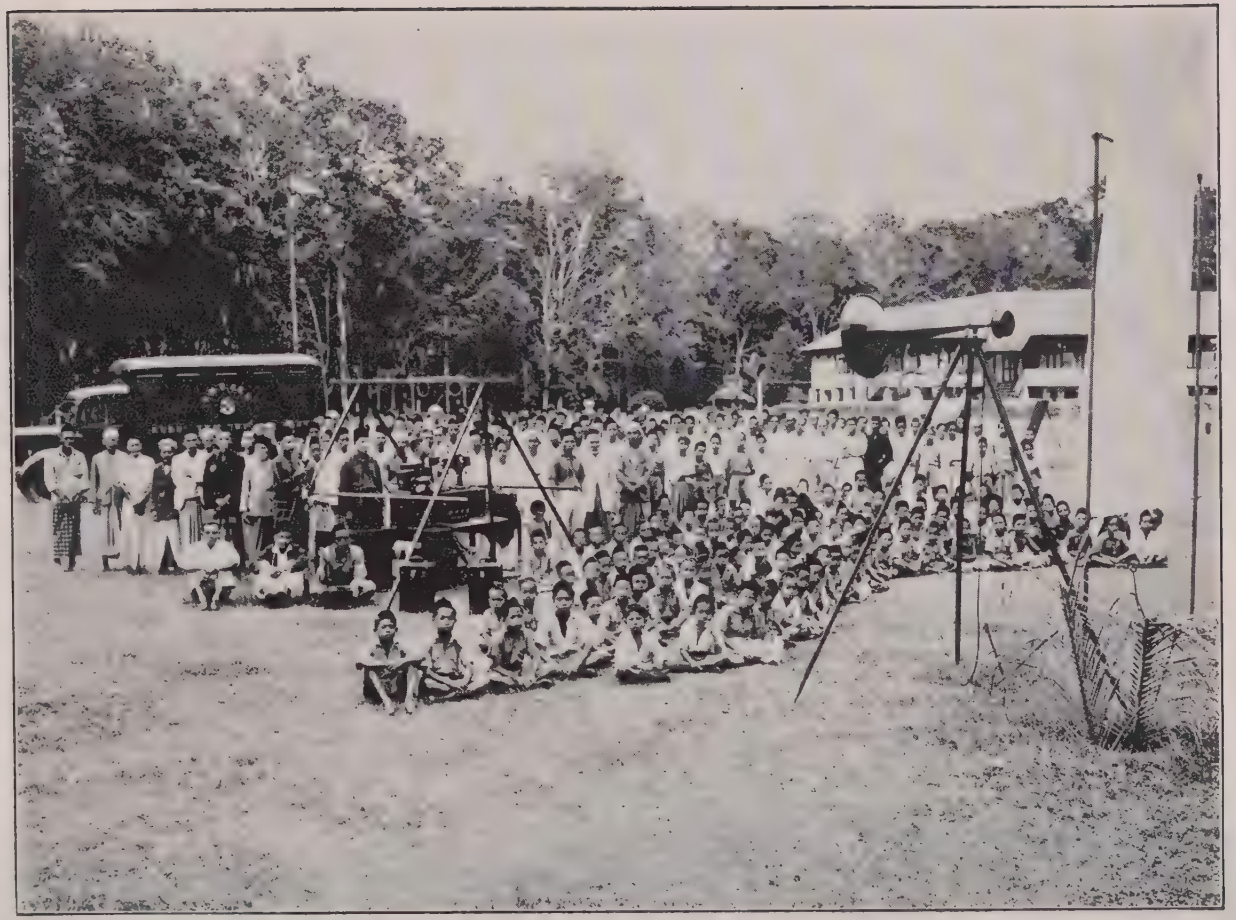
When considering the design of the new caravan, the sub-committee made every effort to obviate the repetition of certain drawbacks which experience had brought to light in the construction of the old caravan. These drawbacks were, in brief, as follows:—

(i) The old vehicle was cramped for space in respect of all dimensions.

(ii) In the early stages, a considerable amount of the equipment was carried in a trailer. Experience proved that this was not a satisfactory procedure and arrangements had to be made for this equipment to be carried in the

* *Malayan Agricultural Journal*, Vol. XIX, No. 5, May, 1931, and Vol. XXIV, No. 11, November, 1936.

The New Rural Lecture Caravan.



Caravan Equipment in Preparation for an Evening Lecture and Cinema Show.

caravan. Later, additions were made to the extra equipment formerly carried in the caravan and proper stowage of this material proved difficult.

(iii) The body-work of the old caravan was of a very heavy type, wood panelling being used in walls and roof.

(iv) The interior of the caravan was dark owing to difficulty experienced at the time of its construction in obtaining a satisfactory type of white paint.

The Committee found that a 30 cwt. chassis would be suitable for the new Caravan, that sleeping accommodation was not necessary, that there should be 6 ft. head space in the bodywork and that twin rear wheels should be fitted. The Government Factory quoted $3,700 for the complete vehicle, which, taking into account the amount recovered from the insurance company, left a sum of $1,976 to be found by the three joint owners concerned.

Chassis. A chassis of the latest Morris 30 cwt. commercial C.V.S. long wheelbase 6-cylinder type having a rating of 25 h.p. was purchased by the Government Factory through the Crown Agents to the Colonies.

Bodywork. The framework and flooring of the new Caravan are of *chengal*, and the interior and exterior panelling is of sheet aluminium. The interior is painted white, and exterior panelling is spray-painted in dark and medium green.

The coat-of-arms of the Federated Malay States in true heraldic colours appears on one side of the exterior panelling and that of the Straits Settlements on the other.

The letters "F.M.S. & S.S." surmount the coat-of-arms on each side and below are the words "Rural Lecture Caravan." In the centre of the doors at the back of the Caravan is an inscription in Jawi *Suloh Kemajuan Kehidupan Kampong*. All lettering is in gold, and the vehicle presents a handsome appearance.

Subsidiary flush-fitting tanks are provided underneath the body for the storage of Diesel oil (10 gallons) and lubricating oil (2 gallons) for use with the Diesel engine.

These tanks were fitted as the type of oil used by the Diesel engine is not readily obtainable in many places served by the Caravan.

Special attention was given in the design of the Caravan to ensure that the interior should be light and airy.

Extra large windows were fitted in the back doors and at the rear of the driving cab. The rear windows are adjustable. Ample ventilation is assured by the use of louvres on both sides of the body, just below the roof of the Caravan. There is also a grille behind the driving cab to allow a current of air for cooling the Diesel engine and dynamo. A central roof light is fitted.

The interior measurements of the Caravan are: length 11 ft. 2 ins., width 5 ft. 10 ins., height 6 ft.

Interior Fittings and Equipment.

When designing the interior fittings of the Caravan, it was necessary to arrange for a Diesel engine and a dynamo, 2 Kodascope projectors, a lantern and cinema together with their slides and films, a screen, and the gramophone and amplifier equipment to be safely stowed for transport.

Agricultural and rubber exhibits, the property of the Department of Agriculture and the Rubber Research Institute, include padi samples in glass jars and scale models of the Serdang night-ark for poultry, copra kilns and smoke-houses. There are also numerous framed photographs and diagrams to illustrate various planting methods. Light trestle tables are carried for use when exposing the agricultural exhibits. It was arranged that heavy articles such as projectors, gramophone and amplifier equipment should rest on the floor while cabinets and drawers are provided on both sides of the Caravan for the lighter cinema films, slides and agricultural exhibits.

Centrally placed and just behind the driving cab are the Diesel engine and dynamo, which provide current for the cinema. These are permanently clamped to the chassis frame.

The Diesel engine is comparatively new. The amplifier equipment, which was old-fashioned and costly to use and had not given satisfaction during the last few tours, was replaced by a new public address unit purchased in July 1939, and this is giving every satisfaction.

The new Caravan was put into commission for its first tour at the beginning of February, 1939.

Method of Working.

The tour programmes are arranged by the Department of Agriculture with due respect for the phases of the moon, which, at its full, can kill an outdoor film show.

When on tour in any particular area the Caravan is under the supervision of the local Agricultural Officer, who arranges for lectures to be given by the Malay Agricultural Assistant and the Asiatic Rubber Instructor.

The Malay and Indian Co-operative Officers also give lectures at suitable centres. The normal procedure is for the Caravan to spend 2 days in a place, although this is not invariably the rule.

On arrival at the open space, generally the school play-ground, the agricultural exhibits are laid out for view and explanation, the gramophone with loud-speaker amplification helping to attract a crowd.

Penghulus and Ketuas are asked to preside at lectures and discussions.

A lecture is given by the Malay Agricultural Assistant or Asiatic Rubber Instructor between 5 and 6 p.m. and the cinema usually begins about 7 to 7.30 p.m., lasting till 12 midnight.

A similar procedure is repeated on the second day, but instead of a lecture the Malay Agricultural Assistant or the Asiatic Rubber Instructor is available to answer questions relative to the previous day's lecture.

Before a lecture and during a cinema performance, the gramophone supplies music, Malay and Javanese tunes for a *kampong* audience and Tamil records for an estate performance.

The music is much appreciated by the audience, members of which frequently show their gratification by bringing their own records to be played through the loud speaker.

Tours of the Rural Lecture Caravan.

The new Caravan has now completed four tours, in the following centres:—

1939.		
8th-28th February	—	Perak South.
10th-30th March	—	Perak Central
9th-29th April	—	Krian and Perak North.
12th-27th May	—	Ulu Langat and Selangor.

No mechanical trouble has been experienced. Good reports have been received regarding the popularity of the shows at various centres.

Results.

Lectures and cinema performances given in conjunction with tours of the Rural Lecture Caravan have sown the seeds of new ideas in many *kampongs*. Such performances, however, have to be followed up for several months by lecture, demonstration and informal discussion by the local officers of the Department of Agriculture, Rubber Research Institute and Co-operative Societies Department to ensure any lasting betterment. By these means definite results have been achieved by the propaganda of the two Departments and Institute concerned.

The two illustrations show the new Caravan and cinema at work and the agricultural exhibits being explained by a Malay Agricultural Assistant.

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RAT CONTROL ON OIL PALM ESTATES

BY
B. BUNTING,
Senior Agriculturist.

Introductory.

Rats frequently cause considerable damage on oil palm estates. They may attack the palm during all stages of its growth, eating the buds from the centre of young growing plants and later attacking the fruit bunches and female inflorescences. In the latter cases this may lead to serious diminution in production.

In view, therefore, of the importance of rat control, oil palm estates were circularized and asked to report the measures adopted for this purpose. The present article summarizes the resultant replies and incorporates additional information derived from trials carried out at the Central Experiment Station, Serdang, and abstracted from reports by Departmental Officers on the subject.

Damage to Young Palms.

So far as is known, the destruction of young palms has occurred only on newly-planted areas, where there are no fruiting palms to attack. In such areas, damage is commonly associated with a low-growing cover, climbing over fallen timber and tree stumps, resulting in conditions which provide ideal harbourage and breeding places for the rodents.

It seems likely that rats at first feed on the seeds of the cover plants and that later, when multiplication has increased the population pressure on such food supplies, they commence to attack the soft tissues of the seedlings. Even two-year old palms may thus be attacked, the midribs and leaf-stems being gnawn through causing the leaves to collapse and fall to the ground.

On one large estate where extensive planting was in progress some years ago, expenditure on rat control at this stage amounted to more than $2 (Straits currency) per acre per annum. All the known methods of destruction detailed later in this article were tried with little apparent effect on the rat population. Eventually the low-growing cover crop, mostly *Centrosema pubescens,* had to be suppressed, while, in addition, cylindrical guards, 6 ins. diameter and 15 ins. high, made of $\frac{1}{2}$ in. mesh wire netting, were placed around each plant in the field. It was also found advisable to retain the seedling palms in the nurseries until they were 18 to 24 months old.

Damage to Fruiting Palms.

At first the rats attack the fruit bunches only, but as soon as they increase sufficiently in numbers they commence, in addition, to devour the freshly or partially opened female inflorescences.

In the case of the bunches, the rats will gnaw only the outside layers of the pericarp, but when they begin to attack the female inflorescences, frequently consuming one-third or even one-half of an inflorescence, a much more serious loss of potential fruit is involved.

It has not been found possible to assess with any degree of accuracy the amount of damage in these two cases. Estimates supplied by estate managers place the damage at 3 to 5 per cent. loss of fruit when only the bunches are attacked and a minimum of 10 per cent. in those cases were both fruit bunches and female inflorescences are seriously involved. Losses of 5 and 10 per cent. of fruit correspond to approximately 1.25 and 2.5 per cent. reductions in output of oil.

Incidence of Attack.

The incidence of attack varies considerably; for example, there are some estates which suffer practically no damage, while other estates are so heavily infested that uninterrupted and stringent methods of control are required. On a heavily infested estate the number of rats destroyed may be as high as 150 per acre per annum.

Rats would appear to have a migratory habit. Thus, on one estate of between 2,000 and 3,000 acres of mature palms on which damage from rats was practically unknown, the latter suddenly made their appearance about the middle of 1938 and in approximately 3 months more than 75,000 rats were destroyed.

This migratory habit is doubtless correlated with food supply, which in turn is related to rate of breeding. Thus, observations in Java showed that, when the padi harvest was over and that particular food supply exhausted, the rats would migrate to neighbouring fields where other crops such as maize, groundnuts and sugar cane were being cultivated. (1)

In the case of the oil palm this migratory habit should not be so marked since fruit is available at all seasons. It is evident, therefore, that on all estates there is need for constant vigilance to keep the rodents under control, more particularly in view of their prolific rate of breeding.

Records show, however, that the incidence of rat attack is inclined to be seasonal. There are two peak periods, September to November and March to April. The intensity of attack is less marked in the second of these. It is interesting to note that the above periods correspond roughly with the two peak periods of fruit production, thereby suggesting the possibility of a migration to the oil palm when fruit is likely to be more abundant.

As stated previously rats are more prevalent in areas which are maintained under cover crops than in those which are clean-weeded. This applies equally to low-growing leguminous cover crops as well as to fern growths, such as *Nephrolepsis* spp. It appears also that when rats cannot find suitable cover on the ground they will nest in the crown of the palm.

Methods of Control.

The methods of control practised at the present time on oil palm estates are: (a) hunting with dogs, (b) trapping, (c) poisoning by dusting the fruit and female inflorescences with barium carbonate, and (d) establishment of cat farms.

(a) *Hunting*. Periodic hunting by gangs of labourers, armed with stout sticks and accompanied by trained ratting dogs, is stated by some managers to be one of the most effective means of control. The interval between the operations varies according to the extent of infestation. On one estate of about 1,200 acres a gang of 10 Tamil boys patrols this area regularly twice a month, catching about 300 rats per day. They are paid at the rate of 1.5 cents per rat, which corresponds to a daily wage of about 45 cents.

(b) *Trapping*. This method is still in vogue on some estates. On an estate of about 600 acres a party of 3 labourers is regularly employed in trapping, each labourer catching from 35 to 70 rats per day according to the season. Based on wage payments, the cost corresponds to rather more than 1 cent per rat.

The traps are set in different fields each night, about 20 traps being required per acre. One labourer is able to attend to 200 traps.

Dried fish or fresh coconut meat is usually employed as a bait. The traps should be kept clean and lubricated periodically to ensure their working freely. A little oil of aniseed is frequently added to the lubricant to act as an attractant and to mask the odour of human beings or of previously caught rats.

Experience shows that trapping alone is likely to be only partially successful, since the majority of rats caught in the traps are male, the more important female rat remaining at large. Trapping should therefore be combined with some other method of control to ensure a greater degree of success.

(c) *Poisoning*. The dusting of barium carbonate on the fruit bunches and, in some cases, on the female inflorescences has proved an effective means of control on many oil palm estates.

Although some estates dust with barium carbonate at regular intervals of 3 to 4 months, other estates carry out the operation only once or twice a year. In those cases where dusting is employed in addition to other methods of control, infestation is stated to be reduced considerably as a result of a second dusting about one month after the first application.

One estate records freedom from rat infestation solely as a result of dusting with barium carbonate and the operations are carried out only at intervals of about 7 months.

Dusting should preferably be carried out during dry weather, otherwise most of the poison may be washed away. Since rats are usually most troublesome during the period September to November, the dry months of June and July are most suitable for carrying out dusting operations. It is estimated that one labourer can treat an area of 2 to 3 acres of mature palms per day, applying the poison both to fruit bunches and female inflorescences. About 2 lbs. of barium carbonate are required per acre for each round of dusting. With the present price of barium carbonate ranging about $10.50 per cwt., the cost of the material amounts to approximately 18 cents per acre per round. Allowing for labour, the cost of each dusting should not exceed 40 cents per acre. It will be appreciated that the cost of dusting will depend on the state of development of the palms.

Experiments conducted at Serdang on the use of barium carbonate showed that a proprietary mixture consisting of 70 per cent. of the chemical and 30 per cent. of an inert filler adhered to the inflorescences and fruits better than the pure barium carbonate dust. Further, it was found that this mixture could be stored for longer periods in an ordinary tin container than the pure chemical. Barium carbonate shows a tendency to become lumpy even though stored in a dry place, thereby detracting from its value as a dusting power.

Neither barium carbonate nor the proprietary mixture, even though applied to the stigmas when they were in a receptive state, had any material effect on the fertilization of the flowers and the subsequent development of the fruit bunches(2).

Poisoning by means of baits in the form of pellets containing thallium sulphate and white phosphorus placed in the runs leading to the nests has been tried. No great degree of success was obtained.

(d) *Cat Farms.* A few estates have established cat farms with a view to turning the cats loose among the palms to hunt the rats.

On one estate of approximately 600 acres three lots of 100 cats each were housed in different parts of the estate. These cats are kept locked up for two or three months until they produce young. When the kittens begin to grow, they are fed on rice and milk in the morning and rats in the afternoon. After some time they are allowed to run loose among the palms, but to encourage them to stay on the estate a certain amount of cooked rice is placed outside the houses each day. This method of control is stated to be fairly effective and if the rats are not caught they are driven off the estate by the semi-wild cats.

A sharp look-out must be kept for panthers which, if undetected, will play havoc with the cat population.

On other estates the practice has been to purchase a batch of 50 to 100 cats, turning them loose in the fields without providing shelter or food. In such cases the cats become completely wild.

Cost of Rat Control.

As mentioned previously the usual rate of remuneration is about 1 cent per rat, although on some estates a difference is made between the rate for male and female rats. Half a cent may be paid for a male rat and 2 cents for a female rat.

Dusting with barium carbonate costs about 40 cents per acre per round, including the cost of the poison and the labour for dusting.

Estates on which rat infestation is serious estimate the cost of control at $1 to $1.50 per acre per annum, but in cases where rats are not so troublesome, the cost is said to vary from 50 to 75 cents per acre per annum.

Summary.

While some estates prefer poisoning with barium carbonate as a means of rat control, others adopt either hunting or trapping. A few estates have established cat farms; this method of control, however, has proved to be only partially successful and it has usually been found necessary in such cases to resort either to poisoning or hunting by labourers.

There is no doubt that rats gradually become accustomed to certain measures of control, more particularly trapping and poisoning, and it is only by constantly changing the methods that the best results are likely to be obtained.

Acknowledgment.

The writer wishes to express his thanks to the various agency houses and managers of oil palm estates for supplying him with information on this subject.

References.

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Departmental.

FROM THE DISTRICTS.

September, 1939.

Compiled in the Office of the Chief Field Officer from Monthly Reports of Agricultural Officers.

The Weather.

Heavy rain occurred almost everywhere during September. On the west coast from Selangor northwards to Kedah there were particularly heavy falls of rain and the total precipitation was above normal. Elsewhere normal wet season weather was experienced.

In Kelantan the first half of the month was dry. Frequent storms in the second half brought the total precipitation up to normal.

Crop Reports.

Rubber.—Following the outbreak of war rubber prices soared, and reached $52 per picul in Penang. Later the price of smoked sheet steadied at around $45 per picul. Uncouponed rubber is now fetching $18 per picul and the value of coupons has correspondingly decreased. Many holdings are now being brought into tapping again after a long period of resting. Owners of rubber land are at present obtaining a higher income than they have since 1937.

Under present market conditions there are indications that the small-holder does not consider replanting so attractive a proposition as it appeared to him even a month ago.

It is reported that small-holders are taking a renewed interest in the production of smoked sheet. New smoke cabinets have been constructed and old ones re-conditioned. The present price margin of $2 to $3 per picul between smoked and unsmoked sheet once again makes smoke curing worth while for the small producer.

Unemployed youths at Dong in Pahang are being given instruction once a week in budding rubber. It is expected that they will have a good market for their skill in 1940 by which time many holdings will be ready for budding.

Padi.—The rains enabled planters to get ahead with cultivation in all padi areas. At Sungei Acheh, Province Wellesley, very heavy falls of rain occurred in the middle of the month and floods resulted. Some of the newly planted padi was destroyed. In Negri Sembilan and Malacca, in spite of the rain, water supplies are not yet up to normal. Very little rain fell at Jasin and Alor Gajah in Malacca and in Alor Gajah particularly padi land is still very dry.

In Kelantan the late arrival of the rains has resulted in a shortage of water and the outlook for the wet padi crop is not at the moment particularly bright. The dry padi crop on the other hand has had a reasonably good start and prospects are favourable.

Although owners of padi land seem to have responded to the drive to get an increased area planted this season, it is felt that the present high price of rubber may in many instances result in a transference of activity from rice fields to rubber holdings.

A quite remarkable increase in the area under wet padi in Brunei is taking place, particularly so in view of the very small population of this State. Between 1st January, 1939, and 25th September over 800 applications for titles for wet padi land were received, representing an area of only slightly less than 2,000 acres.

Food Crops.—An increase in the planting of food crops may now be observed. Small-holders are advised to plant up any unoccupied portions of their holdings with suitable food crops. Estate managers are also giving the matter their attention and on many estates nurseries of planting material have been laid down and areas are being prepared on which food crops may be planted to augment the food supply of the labour force should a shortage occur.

Owners of coconut holdings have been badly hit by the low price of copra. In East Pahang small-holders are finding it profitable to tap their palms for the production of sugar.

"Ladies Days" at Padi Test Stations.

It is the custom of the country that much of the arduous work of padi cultivation and also the actual planting and harvesting of the crop is undertaken by the Malay women, and in fact they often know as much, if not more, about padi and padi cultivation than do the men; in addition it is, of course, the women who do the cooking of the rice. Consequently in matters relating to padi planting it is often the women who determine what variety shall be planted and in what manner. In the ordinary course of events these women would never visit a Padi Test Station and would, therefore, never receive practical proof of the advantage of planting improved strains of padi or of undertaking such better methods of cultivation as are being advocated by the Department. For this reason the innovation of "ladies days" have been instituted and in some instances they have been outstandingly successful. Such a gathering was held at Genting Test Station in Province Wellesley during September. About 100 women were present. They were shown round the Station by the Malay Agricultural Assistant, chaperoned by his wife and accompanied by kampong elders. The women asked many questions and evinced an intelligent interest in all that they were shown.

DEPARTMENTAL NOTES.

Recent Departmental Publications.

The Department of Agriculture has recently revised several of the Agricultural Leaflets, which are available for free distribution in Malaya, and also published new Leaflets on food crops suitable for cultivation during the present state of emergency.

The following are particulars of such Leaflets.

No. 1. Derris. 3rd and revised edition.
6. Cover Crops. 2nd and revised edition.
7. Green Manures -do-
8. Fodder Grasses -do-
15. Lawn Grasses -do-
18. The Cultivation of Allotments by Tamil Labourers. (Also in Tamil). 2nd and revised edition.

New Leaflets.

No. 19. Ragi.
20. Yams.

A 2nd and revised edition of Leaflet No. 5, Bananas, is now being prepared and will be available by the end of October.

The following Special Bulletins have recently been published.

Scientific Series.

No. 22. The Identification of Grubs from Rubber Estates, by G. H. Corbett and N. C. E. Miller. 50 cents.

Economic Series.

No. 10. Malayan Agricultural Statistics 1938, by D. H. Grist. $1.

A full list of available Departmental publications appears at the end of this Journal, and all publications can be obtained on application to the Agricultural Economist, Department of Agriculture, S.S. & F.M.S., Kuala Lumpur.

Leave.

Mr. J. R. P. Soper, Agricultural Officer, returned from leave on the 21st September, 1939, and assumed duty as Supplementary Agricultural Officer, Perak South, on the 26th September.

Appointment.

Mr. Gunn Lay Teik, Chemist, has been appointed to act as Chemist (Coconut Products) in addition to his own duties with effect from 24th July, 1939.

Mr. J. Cook, Agricultural Officer, was transferred from the Central Experiment Station, Serdang, and assumed duty with effect from 25th September as Supplementary Agricultural Officer, Selangor, in connexion with the efforts being made to increase the production of padi and food crops generally.

FERTILIZER PRICES, SEPTEMBER, 1939.

The following are the prices current for the month of September, 1939, of some of the more important fertilizers.

Product.	Analysis				Price per ton $
	Nitrogen (N)	Phosphoric Acid (P_2O_5)		Potash (K_2O)	
		Soluble	Insoluble		
Sulphate of Ammonia ...	20.6	—	—	—	80.00
Calcium Cyanamide ...	20.6	—	—	—	95.00
Muriate of Potash ...	—	—	—	50	115.00
Sulphate of Potash ...	—	—	—	48	120.00
Superphosphate (concentrated) ...	—	39	—	—	110.00
Superphosphate ...	—	16-18	—	—	65.00
Basic Slag ...	—	—	16	—	52.00
Rock Phosphate (Christmas Island) ...	—	11*	38‡	—	33.50¶
Rock Phosphate (very finely ground Gafsa) ...	—	11*	26 - 28‡	—	40.00
Lime ...	—	—	—	—	20.00

* Citric soluble. ‡ Total ¶ $31.50 per ton ex-warehouse, Singapore.

Quotations are *ex* warehouse, Port Swettenham, Klang, Singapore and Penang, with the exception of muriate of potash which is *ex* warehouse, Port Swettenham, Klang and Singapore.

Statistical.

MARKET PRICES.

September, 1939.

Major Crops.

Rubber.—The month was notable for violent fluctuations in the rubber market due to the commencement of hostilities. No. 1. X. Ribbed Smoked Sheet, which opened at 29½ cents per lb., rose rapidly to 38 cents, fell to 34 cents, rose again to 39 cents, and then fell steadily to close at 33¾ cents.

The average of daily quotations for the month was 35.13 cents per lb., as compared with 28.51 cents in August. The London average price was 9.59 pence per lb., and New York 21.03 cents gold, as compared with 8.57 pence and 16.56 cents gold respectively in August.

Prices paid for small-holders' rubber at three centres during the month are given in Table I.

Table I.

Weekly Prices Paid by Local Dealers for Small-Holders' Rubber, September, 1939.

(Dollars per picul of 133 1/3 lbs.)

Grades	Kuala Kangsar, Perak	Kuala Pilah, Negri Sembilan			Batu Pahat, Johore.	
	6	7	21	28	6	13
Smoked sheet ...	35.00	41.00	43.40	40.00	45.30	—
Unsmoked sheet ...	—	—	—	39.50	40.39	44.00
Scrap ...	—	—	—	—	—	—

Transport by F.M.S.R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway $10.00 per ton (minimum consignment 5 tons).

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

No purchases of rubber at Kuala Kangsar on the 13th, 20th and 27th, at Kuala Pilah on the 14th, and at Batu Pahat on the 20th and 27th September.

Palm Oil.—Prices at the 1st September were: palm oil £13, kernels £8.5.0. Nominal quotations later were in the neighbourhood of £16 for oil but subsequently a Government controlled price of £14.15 per ton was fixed. The averages of the August quotations were:—palm oil £12.5.0, kernels £8.1.8.

Copra.—At the commencement of the war the copra market fell heavily but recovered towards the end of the month. The sun-dried grade opened at $3.20 per picul but fell to $2.25 on the 6th September; in the second half of the month the price improved and the market closed at $3.65. The Singapore average price for the month was $2.88 per picul as compared with $3.50 in August. The mixed grade continued at 30 cents per picul lower than the sun-dried grade.

Copra cake fell to $1.80 per picul but recovered to $2, averaging $1.94 as compared with $2 in August.

Rice.—The Singapore average wholesale prices of rice per picul in August were as follows:—Siam No. 2 Ordinary $3.72, Rangoon No. 1 $3.55, Saigon No. 1 $3.25, as compared with $3.64, $3.55 and $3.37 in July, and with $4.34, $3.82 and $4.05 in August 1938.

The average retail prices in cents per gantang (gallon) of No. 2 Siam rice were:—Singapore 24, Penang 30, Malacca 28, as compared with 26, 31 and 28 in July.

The average declared trade value of imports during August was $3.54 per picul as compared with $3.66 in July and $3.68 in June.

Padi.—The Government Rice Mills, Perak and Pahang, maintained unchanged their price of $2.20 per picul for padi. Retail prices of padi per 100 gantangs (gallons) ranged from $7 to $15 in Negri Sembilan, from $8 to $14 in Pahang, from $10 to $13 in Selangor, from $8.50 to $14 in Perak, varying with locality. In Penang and Province Wellesley the price was $9.55 and in Kedah from $7.30 to $7.70. In Brunei the range was $10 to $12 and in Labuan $11 to $14.

Pineapples.—Prices continued unchanged at the levels laid down by the Central Board of Packers. Prices, per case of 48 cans of 1½ lbs. each, were G.A.Q.: Sliced Flat $3.20, Sliced Tall $3.35, Cubes $3.25; Golden: $3.60, $3.75 and $3.65 respectively.

Canning factories were closed during September and fresh fruit prices are therefore not available.

Beverages.

Tea.—No London prices are available for September.

The latest Colombo prices available, quoted from *The Ceylon Tea Market Report* of 19th September, 1939, of the Colombo Brokers' Association, are as follows, in rupee cents per lb.:—High Grown Teas 96, Medium Grown Teas 84, Low Grown Teas 76.

Coffee.—Liberian coffee was quoted throughout the month in Singapore at $15.50 per picul. Excelsa improved from $10.25 to $10.50, and Robusta rose from $7 to $7.50.

The average of highest and lowest quotations in Singapore for Palembang coffee was $9.90 to $11.88 per picul, and for Sourabaya coffee $12.69 to $15.31. The August averages were $11.10 to $12.80 and $9 to $10.35 respectively.

Spices.

Arecanuts.—The averages of the Singapore Chamber of Commerce quotations per picul, which were stated to be approximate only, were:—Best $6.25, Medium $5.96, Mixed $5.64.

The averages of the highest and lowest quotations per picul in Singapore were as follows:—Splits $3.94 to $5.44, Red Whole $4.69 to $6.44, Sliced $6.56 to $8.63, as compared with $4.05 to $5.40, $4.30 to $5.55, and $8.70 to $10.65.

Pepper.—Prices rose early in the month, and averages of quotations per picul were: Singapore Black $8.65, Singapore White $14.05, Muntok White $14.70. August averages were: $7.25, $11.25 and $11.50 respectively.

Nutmegs.—No quotations have been given after the opening ones of $24.50 per picul for 110's and $28 for 80's. In August both grades were quoted at $28 per picul. Penang dried nutmegs were sold at $18.50 per picul.

Mace.—No quotations have been available after the opening ones of $85 per picul nominal for Siouw and $46 for Amboina. The August average prices were $85 and $51.50 respectively. Locally produced mace, dry, was sold in Penang at $70 per picul.

Cloves.—Nominal quotations available were unchanged at $40 per picul for both Zanzibar and Amboina.

Cardamoms.—Green cardamoms were quoted in *The Ceylon Chamber of Commerce Weekly Report* of 18th September, 1939, from Rs. 1.25 to Rs. 1.50 per lb.

Miscellaneous.

Derris.—The invalidation of the Dennis patent has so far had no opportunity to affect prices adversely. The war resulted at the beginning of the month in an increased demand for nearby shipments and the Singapore market prices improved by approximately $2 per picul. In the hope that the market would rise further dealers have been reluctant to sell. Average prices per picul for September were as follows:—$9 to $10 for roots sold on a basis of ether extract, and $18 to $20 for roots sold on rotenone content.

Gambier.—There was no change in Singapore prices during September, and they were: Block $8 per picul nominal, Cube No. 1 $17.

Sago.—Prices rose considerably in Singapore but fell back slightly at the close. Pearl rose from $4.25 per picul to $12 and closed at $10, averaging $7.90, while Flour, Sarawak Fair, rose from $2.50 to $10, and closed at $7.50, averaging $5.71 per picul. The August average prices were $4.09 and $2.50 respectively.

Tapioca.—Only opening and closing prices are available. All grades rose from a little over $4 to $9.50 per picul. Average prices per picul were: Flake Fair $6.87, Seed Pearl $6.95, Medium Pearl $7.05. The August averages were: $4.06, $4.32 and $4.60 respectively.

Tobacco.—The general range of prices of dried leaf per picul was: 1st quality $23 to $37, 2nd quality $14 to $26, 3rd quality $8.50 to $20. In Negri Sembilan the range was $12 to $28, $8 to $20, $7 to $8, and in Pahang $14 to $30, $10 to $16, $5 to $8. In Malacca the price rose from $21 per picul in August to $31 in September.

The above prices are based on London and Singapore daily quotations for rubber, on the Singapore daily prices for copra, on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports and certain coffee prices are kindly supplied by Guthrie & Co. Ltd., Kuala Lumpur, the Singapore prices of imported coffee and arecanuts by Lianqui Trading Company of Singapore, and Singapore derris prices by Hooglandt & Co., Singapore.

1 picul = 133 1/3 lbs. The dollar is fixed at two shillings and four pence.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Trafalgar Square, London, W.C.2.

GENERAL RICE SUMMARY*

August, 1939.

Malaya.—Imports of foreign rice during August were 69,717 tons†, and exports 12,727 tons. Net imports were accordingly 56,990 tons, as compared with 65,212 tons in 1938.¶

Of the August imports, 50 per cent. were consigned to Singapore, 14 per cent. to Penang, 7 per cent. to Malacca, 22 per cent. to the Federated Malay States, and 7 per cent. to the Unfederated Malay States. The foreign imports by countries of origin were as follows (in tons, percentages in brackets):— Thailand 47,150 (67.6), Burma 15,201 (21.8), French Indo-China 6,232 (9.0), other countries 1,134 (1.6).

Of the exports during August, 64 per cent. were consigned to the Netherlands Indies and 36 per cent. to other countries. The various kinds of rice exported were as follows (in tons, percentages in brackets):— Thailand 11,052 (86.9), Burma 830 (6.5), French Indo-China 751 (5.9), parboiled 79 (0.6), Malayan production 15 (0.1).

August net imports by countries of origin were (in tons, percentages in brackets):— Thailand 36,098 (63.4), Burma 14,371 (25.2), French Indo-China 5,481 (9.6), elsewhere 1,040 (1.8).

India.—Foreign exports during January to July were 175,000 tons, as compared with 164,000 tons in 1938, an increase of 6.7 per cent. Of these exports 2.9 (3.0) per cent. were to the United Kingdom, 1.7 (4.9) per cent. to the Continent of Europe, 33.7 (37.2) per cent. to Ceylon, 4.0 (4.9) per cent. to the Straits Settlements and the Far East, and 57.7 (50.0) per cent. to other countries. The percentages in brackets are for the corresponding period in 1938.

Burma.—Foreign exports from the 1st January to 23rd August totalled 2,858,448 tons, as compared with 2,366,314 tons in 1938, an increase of 20.8 per cent. Of these exports 57.4 (41.2) per cent. were to India, 7.9 (9.8) per cent. to the United Kingdom, 7.3 (8.8) per cent. to the Continent of Europe, 9.2 (11.6) per cent. to Ceylon, 8.8 (14.0) per cent. to the Straits Settlements and the Far East, and 9.4 (14.6) per cent. to other countries. The percentages in brackets are for the corresponding period of 1938.

Average August prices of rice in rupees per 100 baskets of 75 lbs. each at Rangoon were:— Big Mills Specials 220, Small Mills Specials 225.

Thailand.—Exports of rice and rice products from Bangkok during the first half-year were 930,076 tons, as compared with 818,709 tons in 1938.

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* Abridged from the Rice Summary for August, 1939, compiled by the Department of Statistics, Straits Settlements and Federated Malay States.

† Ton = long ton (2,240 lbs.)

¶ It is to be understood throughout the summary that all comparisons and percentage increases or decreases are in relation to the corresponding period of 1938.

Japan.—The latest information available was published in the June Summary.

French Indo-China.—Entries of padi into Cholon during the period 1st January to 15th August totalled 1,201,956 tons, as compared with 809,506 tons in 1938, an increase of 48.5 per cent. Exports of rice during the same period were 1,189,441 tons, as compared with 838,598 tons in 1938, an increase of 41.8 per cent.

The Netherlands Indies.—The latest information available was published in the March Summary.

Ceylon.—Imports during January to August totalled 404,074 tons, as compared with 376,088 tons in 1938, an increase of 7.4 per cent. Of these imports 14.5 (17.6) per cent. were from British India, 62.4 (70.6) per cent. from Burma, 0.2 (0.3) per cent. from the Straits Settlements, and 22.9 (11.5) per cent. from other countries. The 1938 percentages are in brackets.

Europe and America.—Shipments from the East to Europe from the 1st January to 11th August totalled 971,697 tons, as compared with 904,396 tons in 1938, an increase of 7.4 per cent. Of these shipments 36.8 (43.0) per cent. were from Burma, 46.7 (46.5) per cent. from Saigon, 15.6 (9.1) per cent. from Thailand, and 0.9 (1.4) per cent. from Bengal. The 1938 percentages are in brackets.

Shipments for the Levant from 1st January to 5th August totalled 14,535 tons, as compared with 26,735 tons in 1938, a decrease of 45.6 per cent. Shipments for Cuba, West Indies and America from 1st January to 31st July were 119,712 tons, as compared with 122,075 tons in 1938, a decrease of 1.9 per cent.

MALAYAN AGRICULTURAL EXPORTS, AUGUST, 1939.

PRODUCT	Net Exports in Tons				
	Year 1938	Jan./August 1938	Jan./August 1939	August 1938	August 1939
Arecanuts ...	33,769	26,383	25,114	2,679	3,179
Coconuts fresh†‡ ...	116,743†	68,525†	66,250†	7,472†	6,536†
Coconut oil‡ ...	49,140	28,815	39,523	4,185	6.552
Copra‡ ...	68,754	28,267	34,490	2,823	17,969
Copra cake ...	7,112	4,628	6,164	745	1,505
Gambier, all kinds ...	1,632	1,104	1,055	234	168
Palm kernels ...	9,359	5,412	6,497	570	725
Palm oil ...	54,377	35,645	39,335	6,368	10,920
Pineapples, canned ...	73,168	55,038	60,297	5,349	5,673
Rubber¶ ...	360,898¶	257,736¶	218,615¶	26,754¶	28,780¶
Sago,—flour ...	4,537	352	3,812	321*	67
,, —pearl ...	4,203	2,761	2,329	443	289
,, —raw ...	5,088*	3,557*	3,204*	316*	491*
Tapioca,—flake ...	981	631	575	117	26
,, —flour ...	3,072*	2,243*	1,896*	69*	321*
,, —pearl ...	17,818	12,843	11,228	1,834	1,485
Derris ...	676	336	726	52	68
‡Copra equivalent ...	150,944	76,461	100,040	9,772	28,745

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION OF PALM OIL AND KERNELS

(In long tons, as declared by Estates).

Month 1939	Palm Oil			Palm Kernels		
	F.M.S.	U.M.S.	Malaya	F.M.S.	U.M.S.	Malaya
January ...	2,402.5	2,726.3	5,128.8	429.7	502.0	931.7
February ...	2,193.4	1,693.3	3,886.7	372.9	282.0	654.9
March ...	2,453.1	2,324.8	4,777.9	437.9	394.0	831.9
April ...	2,160.5	2,082.2	4,242.7	423.4	346.0	769.4
May ...	2,066.0	1,760.1	3,826.1	403.1	274.1	677.2
June ...	2,204.8	2,030.2	4,235.0	368.9	318.0	686.9
July ...	2,522.8	2,360.9	4,883.7	437.0	353.0	790.0
August ...	3,613.2	3,004.2	6,617.4	680.8	554.0	1,234.8
Total ...	19,616.3	17,982.0	37,598.3	3,553.7	3,023.1	6,576.8
Total January to August, 1938 ...	18,004.5	13,926.2	31,930.7	3,183.8	2,308.0	5,491.8
Total for the year 1938 ...	28,979.0	22,087.7	51,066.7	5,158.9	3,620.0	8,778.9

Stocks on estates as at 31st August, 1939, were: palm oil 3,462 tons, palm kernels 984 tons.

ACREAGES OF TAPPABLE RUBBER ACTUALLY TAPPED AND NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST AUGUST, 1939.

STATE OR TERRITORY	Estimated Acreages of Tappable Rubber (9)+(11)	ACREAGES OF TAPPABLE RUBBER NOT TAPPED				Area of tappable rubber never been tapped (b)		Total area not tapped (3)+(5) (c)		TOTAL AREA TAPPED DURING THE MONTH		Area of tappable rubber rested under rotational systems (c)	
		On estates which have entirely ceased tapping		On estates which have partly ceased tapping (a)									
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)	Acreage	Percentage of (9) to (2)	Average	Percentage of (11) to (2)	Acreage	Percentage of (13) to (2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
S. S.—													
Province Wellesley ...	43,044	928	2.2	13,394	31.1	507	1.2	14,322	33.3	28,722	66.7	7,845	18.2
Malacca ..	118,205	4,792	4.1	34,576	29.2	2,048	1.7	39,368	33.3	78,837	66.7	23,477	19.9
Penang ..	2,505	nil	nil	1,106	44.2	35	1.4	1,106	44.2	1,399	55.8	60	2.4
Singapore .	32,052	5,475	17.1	9,905	30.9	275	0.9	15,380	48.0	16,672	52.0	3,732	11.6
Total S.S. ...	195,806	11,195	5.7	58,981	30.1	2,865	1.5	70,176	35.8	125,630	64.2	35,114	17.9
F. M. S.—													
Perak ...	284,009	10,602	3.7	70,180	24.7	7,404	2.6	80,782	28.4	203,227	71.6	48,424	17.1
Selangor ...	315,651	8,037	2.5	69,601	22.1	6,937	2.2	77,638	24.6	238,013	75.4	51,887	16.4
Negri Sembilan ...	261,831	11,624	4.4	68,994	26.4	11,706	4.5	80,618	30.8	181,213	69.2	40,823	15.6
Pahang ...	85,286	4,383	5.1	25,561	30.0	5,505	6.5	29,944	35.1	55,342	64.9	9,969	11.7
Total F.M.S. ...	946,777	34,646	3.7	234,336	24.7	31,552	3.3	268,982	28.4	677,795	71.6	151,103	16.0
U. M. S.—													
Johore ...	478,161	17,831	3.7	144,598	30.3	36,457	7.6	162,429	34.0	315,732	66.0	60,892	12.7
Kedah ...	199,315	9,816	4.9	28,096	14.1	6,687	3.4	37,912	19.0	161,403	81.0	42,460	21.3
Kelantan ...	31,204	403	1.3	7,051	22.6	2,237	7.2	7,454	23.9	23,750	76.1	5,463	17.5
Trengganu (d) ...	4,817	nil	nil	42	0.9	nil	nil	42	0.9	4,775	99.1	2,301	47.8
Perlis (e) ...	1,459	380	26.0	341	23.4	155	10.6	721	49.4	738	50.6	394	27.0
Brunei ...	5,918	nil	nil	1,833	31.0	313	5.3	1,833	31.0	4,085	69.0	1,458	24.6
Total U.M.S. ...	720,874	28,430	4.0	181,961	25.2	45,849	6.4	210,391	29.2	510,483	70.8	112,968	15.7
Total MALAYA ...	1,863,457	74,271	4.0	475,278	25.5	80,266	4.3	549,549	29.5	1,313,908	70.5	299,185	16.1

Notes.—(*a*) Area out-of-tapping on estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(*b*) The acreage shown in column (7) is included in columns (3) and (5).

(*c*) Areas of tappable rubber rested under rotational systems are not considered as out-of-tapping and therefore columns (11) and (12) include columns (13) and (14) respectively.

(*d*) Registered companies only.

MALAYAN RUBBER STATISTICS Table I.

ACREAGE, STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF AUGUST, 1939, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January to July 1939		during the month		January to July 1939						
	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to July 1939	during the month	Jan. to July 1939	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to July 1939
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	5,117	25,372	10,907	78,066	3,765	32,275	Nil	Nil	Nil	Nil	14,403	3,417	90 947	23,563	...	3,334	23,984	23	144
Johore ...	...	2,186	9,459	4,430	34,203	2,656	21,320	Nil	72	Nil	405	3,188	5,243	20,923	36,816	...	1,441	8,931	...	...
Kedah ...	...	281	5,529	2,765	19,485	614	5,525	Nil	Nil	Nil	Nil	1,933	1,617	11,997	13,408	...	204	5,435	...	...
Perlis ...	...	18	27	14	77	13	154	Nil	Nil	Nil	Nil	Nil	29	Nil	231	...	10	33	...	...
Kelantan ...	...	520	680	388	2,520	436	4,261	Nil	Nil	Nil	Nil	321	523	2,091	4,598	...	406	774	...	...
Trengganu ...	...	30	333	146	1,063	151	1,701	Nil	Nil	Nil	Nil	Nil	292	Nil	2,736	...	15	353	...	...
Brunei ...	...	10	83	48	299	61	450	...	...	...	...	...	112	...	759	...	8	82	...	...
Total Malay States	...	8,162	41,483	18,698	135,713	7,696	65,686	Nil	72	Nil	405	19,845	11,233	125,958	82,111	...	5,418	39,592	23	144
S. SETTLEMENTS :—																				
Malacca ...	...	1,504	2,261	1,023	7,410	494	3,805	Nil	} 11,297	Nil	} 80,615	2,602	} Nil	16,761	} Nil	...	1,363	2,111	...	...
Province Wellesley	...	1,225	991	438	2,905	188	1,224	Nil		Nil		8,236		47.041		...	903	954	...	...
Penang ...	1,428	3,239	19	17	128	55	510	2,843		19,905						947	2,096	21	...	...
Singapore ...	4,310	18,085	285	106	819	55	340	9,760		95,607		22,814		156,787		4,453	13,074	250	25	210
Labuan ...	...	18	Nil	Nil	Nil	10	75	32		408		Nil		Nil		...	13	Nil	...	...
Total Straits Settlements ...	5,738	24,071	3,556	1,584	11,262	802	5,954	12,635	11,297	115.920	80.6 5	33,652	Nil	220.589	Nil	5,400	17,449	3,336	25	210
Total Malaya ...	5,738	32,233	45,039	20,282	146,975	8,498	71,640	12,635	11,369	115.920	81,020	53,497	11,233	346.547	82,111	5,400	22,867	42,928	48	354

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Province We'sly D'dings M'cca.	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	2,736	12,714	1,862	1,945	1,200	131
WET RUBBER	598	360	234	342	241	73
TOTAL ...	3.334	13.074	2,096	2,287	1,441	204

TABLE III
FOREIGN EXPORTS

PORTS	For month	Jan. to July 1939
29	30	31
Singapore ...	35,940	237.654
Penang ...	11,839	72,917
Port Swettenham.	5.576	35,161
Malacca ...	142	815
MALAYA ...	53.497	346.547

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	Jan. to July 1939
32	33	34
Malay States ...	30,967	207,562
Straits Settlements	2,564	17.029
MALAYA ...	33.53[illegible]	224.591

Notes:—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained
2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Columns (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S and F.M.S., at Singapore on 23rd September, 1939.

METEOROLOGICAL SUMMARY, MALAYA, AUGUST, 1939.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes						Total.		Most in a day.	Number of days.					Total.	Daily Mean.	Per cent.
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						hrs.	hrs.	
Railway Hill, Kuala Lumpur, Selangor ...	92.1	71.7	81.9	97	70	88	75	83.8	84.8	2.77	70.4	1.32	11	8	2	2	—	194.55	6.27	51
Bukit Jeram, Selangor† ...																				
Sitiawan, Perak ...	90.8	72.5	81.7	94	70	86	76	85.0	85.4	1.64	41.7	0.50	8	7	2	—	—	207.50	6.69	55
Ipoh Aerodrome, Perak ...	90.6	72.2	81.4	95	70	84	75	83.5	84.5	3.77	95.8	2.07	7	7	—	—	—	155.72	5.02	41
Temerloh, Pahang ...	91.4	71.8	81.6	95	69	84	75	85.9	87.0	3.11	79.0	2.10	10	6	1	13	—	200.85	6.48	53
Kuala Lipis, Pahang ...	90.2	71.0	80.6	95	69	82	74	82.9	84.6	4.48	113.8	1.23	12	9	3	26	2	173.40	5.59	46
Kuala Pahang, Pahang ...	88.1	74.3	81.2	91	71	83	77	86.3	88.1	4.92	125.0	1.54	10	7	4	—	3	208.95	6.74	55
Kallang Aerodrome, S'pore ...	85.9	75.9	80.9	90	72	81	81	82.0	83.4	7.76	197.1	1.63	17	13	2	—	3	170.30	5.49	45
Bayan Lepas Aerodrome Penang ...	86.3	74.8	80.5	89	72	78	79	83.4	84.5	12.35	313.7	3.19	18	14	3	—	2	196.20	6.33	51
Malacca Town, Malacca ...	85.5	74.4	79.9	88	72	78	78	83.9	85.1	4.45	113.0	1.13	16	13	2	—	5	196.85	6.35	52
Kluang, Johore ...	89.0	71.0	80.0	93	69	84	73	81.8	82.7	2.85	72.4	0.81	13	11	2	1	—	183.65	5.92	49
Mersing, Johore ...	88.5	71.9	80.2	93	69	79	74	82.7	83.2	4.93	125.2	1.60	11	9	8	—	2	190.95	6.16	50
Alor Star, Kedah ...	87.3	74.1	80.7	91	72	79	76	84.4	85.3	7.78	197.6	1.80	11	11	—	—	1	220.70	7.12	58
Kota Bahru, Kelantan ...	90.2	72.8	81.5	94	70	85	76	84.9	85.5	5.40	137.2	1.81	10	7	1	—	—	231.55	7.47	61
Kuala Trengganu, Trengganu	89.3	73.0	81.1	92	70	85	75	86.1	87.0	3.17	80.5	1.26	9	7	5	1	—	198.05	6.39	52
Labuan ...	87.3	77.0	82.1	91	71	79	81	84.7	86.4	11.74	298.2	3.96	12	10	1	—	3	217.70	7.02	57
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft.	74.9	62.7	68.8	79	61	71	65	72.3	72.7	3.16	80.3	1.02	12	9	—	9	1	186.35	6.01	49
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	71.5	57.2	64.3	74	51	66	62	70.2	69.6	2.91	73.9	0.53	16	13	1	3	—	150.85	4.87	39
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	71.2	59.2	65.2	75	57	64	61	*	*	3.77	95.8	0.68	16	14	—	—	3	159.05	5.13	42

* Not recorded.